REMARKS/ARGUMENTS

In this Amendment, Applicants have amended claims and cancelled non-method claims 11-30 from further consideration in this application. Applicants are not conceding that the subject matter encompassed by claims prior to this Amendment is not patentable over the art cited by the Examiner. Claims were amended and cancelled in this Amendment solely to facilitate expeditious prosecution of the pending claims. Applicant respectfully reserves the right to pursue claims, including the subject matter encompassed by claims, as presented prior to this Amendment and additional claims in one or more continuing applications.

The objection to claims 11 and 21 (Third Office Action, pg. 2) are rendered moot by the cancellation of these claims.

1.   Claims 1-10 are Patentable Over the Cited Art

The Examiner rejected claims 1-10 as anticipated by Arakawa (U.S. Patent Pub. No. 2003/0204597).   Applicants traverse with respect to the amended claims.

Amended independent claim 1 recites a method for providing information on a network storage system, comprising: receiving, by a storage resource manager, information from at least one host system identifying storage units the host systems access through at least one identified storage system; probing, by the storage resource manager, the at least one storage system to determine storage units available through the storage system and an identifier of the storage system, wherein the storage system manages access to the storage units and maintains an assignment of host systems to the storage units; and processing, by the storage resource manager, the information received from the host systems on storage units the host systems access and the information probed from the at least one storage system on the storage units available through the storage system; for each storage system determined by probing the at least one storage system, querying, by the storage resource manager, the information received from the host systems on storage units accessed by the host systems to determine at least one host system attached to storage units whose storage unit identifiers match storage unit identifiers available through the storage system; and generating, for each storage system determined by probing the at least one storage system, an association of the determined host systems to storage units for the storage system, wherein the association indicates for each storage system the identifier of the storage system, each storage unit available at the storage system and for each storage unit the at

least one host system accessing the storage unit, and wherein the association is generated by using information independently gathered from the host systems and storage systems.

The added requirement of "for each storage system determined by probing the at least one storage system, querying, by the storage resource manager, the information received from the host systems on storage units accessed by the host systems to determine at least one host system attached to storage units whose storage unit identifiers match storage unit identifiers available through the storage system" and "generating, for each storage system determined by probing the at least one storage system, an association" is disclosed in at least FIG. 8 and paras. 12 and 18 of the Specification. The added requirement that the association is generated by using information independently gathered from the host systems and storage systems is disclosed on at least para. 19 of the Specification.

With respect to the pre-amended claims, the Examiner cited paras. 48-50, 129, 115, 117, FIG. 5, blocks 0110-0117 of Arakawa. Applicants submit a review of the cited Arakawa reveals the cited Arakawa does not disclose the added claim requirements that a storage resource manager gather information from host systems on host systems and the storage units to which they connect and gather information from storage systems on the storage units available, and then for each storage system determined by probing the at least one storage system, query the information received from the host systems on storage units accessed by the host systems to determine at least one host system attached to storage units whose storage unit identifiers match storage unit identifiers available through the storage system. From this information, an association is determined for each storage system indicating the identifier of the storage system, each storage unit available at the storage system and for each storage unit the at least one host system accessing the storage unit.

The cited paras. 48-50 describe how a storage subsystem includes a control unit that provides a server and host with logical volumes by associating the logical volume accessed by the server or the host with a storage area of a disk unit. The logical volumes are associated with virtual volumes. The control unit holds address conversion information required for address conversion processing to permit an external device to treat the storage areas of the disk units as one of a plurality of logical volumes.

The cited Arakawa discusses how a control unit maintains information on how logical volumes are associated with the disk units. However, there is no disclosure or mention in the

cited paras. 48-50 of a storage resource manager that for each storage system determined by probing storage systems, queries information received from the host systems on storage units accessed by the host systems to determine at least one host system attached to storage units whose storage unit identifiers match storage unit identifiers available through the storage system. There is further no disclosure of determining for each storage system, the association indicating the identifier of the storage system, each storage unit available at the storage system and for each storage unit the at least one host system accessing the storage unit, where this association is determined by independently gathering information from the host systems and storage systems. Instead, the cited Arakawa discusses how a storage subsystem maintains information on the assignment of storage to logical volumes, not how a storage resource manager probes the storage subsystem and obtains information from host systems to determine an association of storage systems, storage units and hosts access the storage units as claimed.

The cited FIG. 5 discusses how a host 300 requests additional storage space from a server 200, and the server searches a repository 210 to find a storage area of a logical volume 500 which is not used. If storage space is found, the server 200 creates a virtual volume requested by the host using the located storage area at cited step 1011 and assigns the virtual volume to the host at cited step 1012. (Arakawa, para. 122) The cited FIG. 5 discusses how a server creates a virtual volume for a host from available space in a logical volume maintained by a storage subsystem. Nowhere does this cited FIG. 5 anywhere disclose or mention the claim requirements of a storage resource manager that for each storage system determined by probing storage systems, queries information received from the host systems on storage units accessed by the host systems to determine at least one host system attached to storage units whose storage unit identifiers match storage unit identifiers available through the storage system. There is further no disclosure of determining for each storage system an association indicating the identifier of the storage system, each storage unit available at the storage system and for each storage unit the at least one host system accessing the storage unit, where this association is determined by independently gathering information from the host systems and storage systems. Instead, the cited FIG. 5 discusses how a server 200 determines from an internal repository 210 (see FIG. 2) available storage space in a logical volume to assign to a virtual volume. The server 200 would not need to determine from the hosts the storage units the host can access because in the cited FIG. 5 the server is assigning a virtual volume to the hosts from available storage space.

Applicants note that para. 115 of Arakawa mentions that the server obtains information from the storage subsystem 100 and stores in the repository 210. Para. 116 mentions that the server 200 obtains information about a host bus adaptor of the host, host port and a virtual volume from the host and registers that information in the repository 210. The server further analyzes the topology of the devices. Para. 117 mentions that the server 200 obtains from an agent of the host information about a virtual volume 600 used by application software in the host.

Although paras. 115-117 of Arakawa mention that the server obtains information from the hosts and server, Applicants submit that the cited Arakawa does not discloses that a storage resource manager, for each storage system determined by probing storage systems, queries information received from the host systems on storage units accessed by the host systems to determine at least one host system attached to storage units whose storage unit identifiers match storage unit identifiers available through the storage system. There is further no disclosure of how a storage resource manager probes the storage subsystem and obtains information from host systems to determine an association of storage systems, storage units and hosts access the storage units as claimed. Instead, paras. 115-117 discuss gathering information in the repository, but not making the association as claimed.

Further, there is no disclosure in the cited Arakawa that the generated association, determined by processing the information independently gathered from the host and storage system, indicates for each storage system the identifier of the storage system, each storage unit available at the storage system and for each storage unit the at least one host system accessing the storage unit.

Accordingly, amended claim 1 is patentable over the cited art because the requirements of claim 1 is not disclosed in the cited Arakawa.

Claims 2 and 4-10 are patentable over the cited art because they depend from amended claim 1, which is patentable over the cited art for the reasons discussed above.

Claim 8 depends from claim 7 and further requires maintaining host/storage unit assignment information indicating for one storage system the storage units available through that storage system and the host systems that access the available storage units, wherein the host/storage unit assignment information is generated by processing the host system and storage system information in the data repository.

The Examiner cited paras. 127 and 117 of Arakawa as disclosing the additional requirements of these claims. (Third Office Action, pg. 5). Applicants traverse.

The cited para. 127 mentions a table associating information on virtual volumes with the logical volumes and physical storage units. A column 56 provides virtual volume numbers; a column 58 provides the size of virtual volume; a column 60 provides storage subsystem numbers; a column 62 provides logical volume numbers; a column 64 provides storage area addresses; and a column 66 provides the size of storage area.

Although the cited para. 127 discusses associating virtual volumes, logical volumes, and physical volumes, this does not disclose the claim requirement of indicating for one storage system the storage units available and the host systems that access the available storage units, where this information is generated by processing information separately gathered from the host system and storage system.

The cited para. 117 mentions that the server 200 detects a change in configuration of the devices, which are connected to the SAN 900, a change in topology, etc., and then updates the information stored in the repository 210 to hold new information. The server 200 also obtains, from the agent 340 of the host 300, information about the virtual volume 600 used by the application software 310, an area of the virtual volume 600, a tendency of use, performance, and the like, and then records the information as host information in the repository 210 together with the above-mentioned information.

Although the cited para. 117 discusses how the server gathers information from the hosts and storage subsystem to store in the repository, this does not disclose the claim requirement of indicating for one storage system the storage units available and the host systems that access the available storage units, where this information is generated by processing information separately gathered from the host system and storage system.

Accordingly, claims 8 provides additional grounds of patentability over the cited art because the additional requirements of these claims are not disclosed in the cited Arakawa.

2.   Added Claim 31

        Added claim 31 depends from claim 1 and further requires that the storage resource
manager, host systems, and storage systems, are implemented in separate computing devices that
communicate over a network.

        The added requirements of claim 31 are disclosed on at least FIG 1 and 9 and paras. 7-10,
and 26.

        Claim 31 is patentable over the cited art because it depends from claim 1, which is
patentable over the cited art for the reason discussed above. Moreover, claim 31 adds the
requirement that the storage resource manager, host systems, and storage systems, are separate.
The Examiner had found that this requirement is not mentioned in Arakawa, but that claim 1 did
not explicitly recite the separate feature. (Third Office Action, pg. 5) These dependent claims
further distinguish over the cited Arakawa for explicitly reciting this requirement the Examiner
recognized as absent from Arakawa.

<div align="center">Conclusion</div>

        For all the above reasons, Applicant submits that the pending claims 1-10 and 31
are patentable. Should any additional fees be required beyond those paid, please charge Deposit
Account No. 09-0466.

        The attorney of record invites the Examiner to contact him at (310) 553-7977 if the
Examiner believes such contact would advance the prosecution of the case.

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